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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,229	08/20/2001	Blue John Ramsey	78104.025	9574

7590 11/06/2003

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EXAMINER

WONG, EDNA

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary

Application No.

09/857,229

Applicant(s)

RAMSEY ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,19-30,34 and 35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,19-30 and 34 is/are rejected.
- 7) ☒ Claim(s) 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

This is in response to the Amendment dated October 20, 2003. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Claim Rejections - 35 USC § 102

Claim **34 and 35** have been rejected under 35 U.S.C. 102(b) as being anticipated by **Eichelberger et al.** (US Patent No. 4,416,914).

The rejection of claims 34 and 35 under 35 U.S.C. 102(b) as being anticipated by Eichelberger et al. has been withdrawn in view of Applicants' remarks.

Claim Rejections - 35 USC § 103

I. Claims **1-2 and 20-28** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **WO 97/48257** in combination with **Seeger et al.** (US Patent No. 4,759,970) and **Haney et al.** (US Patent No. 4,411,980).

The rejection of claims 1-2 and 20-28 under 35 U.S.C. 103(a) as being unpatentable over WO 97/48257 in combination with Seeger et al. and Haney et al. has been withdrawn in view of Applicants' remarks.

II. Claims **19, 29 and 30** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **WO 97/48257** in combination with **Seeger et al.** (US Patent No.

4,759,970) and **Haney et al.** (US Patent No. 4,411,980) as applied to claims 1-2 and 20-28 above, and further in view of **Brandt et al.** (US Patent No. 5,922,397).

The rejection of claims 19, 29 and 30 under 35 U.S.C. 103(a) as being unpatentable over WO 97/48257 in combination with Seeger et al. and Haney et al. as applied to claims 1-2 and 20-28 above, and further in view of Brandt et al. has been withdrawn in view of Applicants' remarks.

Response to Amendment

Claim Rejections - 35 USC § 102

Claim **34** is rejected under 35 U.S.C. 102(b) as being anticipated by **JP 63-74681**.

The JP reference teaches an ink comprising:

a particulate material (= TiO₂) suspended in a mixture of a resin (= polyamide resin), an antioxidant and an organic solvent (= methanol),
wherein the resin comprises a polyamide (abstract).

Claim Rejections - 35 USC § 103

I. Claims **1** and **20-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Seeger, Jr. et al.** (US Patent No. 4,759,970) in combination with **WO 97/48257**.

Seeger, Jr. teaches a process for forming a conductive layer on a substrate comprising the steps of:

(a) depositing ink on the substrate to form a seeding layer **13** (col. 5, lines 56-62; and Figs. 2 and 4); and

(b) depositing a first electrically conducting layer on the seeding layer by electroless deposition **14** (col. 8, lines 51-68; and Figs. 2 and 4).

An electrical component is attached to the first conducting layer (col. 11, lines 8-10).

The substrate is formed from a polymer (= organic resin or plastic material) [col. 4, lines 44-68].

The substrate is coated 12 with a copolymer adhesive (col. 5, lines 7-55) [this is the limitation of present claim 21, **thus, the ink is not applied directly onto the substrate**].

The ink comprises a particulate material (= metal component-containing particles) [col. 4, lines 22-67] suspended in a mixture of a resin (= polyamide) [col. 5, line 63 to col. 6, line 5] and an organic solvent (= cellosolve acetate) [col. 6, lines 7-21].

The particulate material is a metal (= metal component-containing particles) [col. 4, lines 22-67].

The resin is a polymer having amide groups (= polyamide) [col. 5, lines 63-69].

The first electrically conducting layer is formed from nickel, copper or gold (col. 10, lines 50-66).

An electrical component is soldered (= Sn62 (RMA) solder paste) onto substrate (col. 11, lines 8-21).

Seeger, Jr. does not teach wherein the depositing ink on the substrate is by means of lithographically printing; wherein the substrate is formed into a flexible sheet; wherein the thickness of the seeding layer is from 3 to 5 microns; wherein the thickness of the first electrically conducting layer is less than or equal to 4 microns; and wherein the thickness of the first electrically conducting layer is about 0.25 microns.

However, the WO reference teaches depositing conductive ink on the substrate is by means of lithographically printing (page 3, lines 22-25). The lithographic printing process offers potential advantages in speed, hardware availability, and small ink volume per unit, which would translate into additional financial and environmental benefits when compared to conventional screen printing and etched copper-clad laminate practice (page 2, lines 5-11).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the process of Seeger, Jr. with wherein the ink is deposited on the substrate by means of lithographically printing because substituting the pad printing of Seeger, Jr. with lithographically printing would have been doing the same endeavor of depositing conductive ink in a desired electrical path configuration as taught by the WO reference (page 2, lines 5-11; and page 3, lines 22-25). Furthermore, the lithographic printing process offers potential advantages in speed, hardware

availability, and small ink volume per unit, which would translate into additional financial and environmental benefits when compared to conventional screen printing and etched copper-clad laminate practice as taught by the WO reference (page 2, lines 5-11).

As to wherein the substrate is formed into a flexible sheet, it is deemed that an organic resin or plastic material substrate is flexible to some degree and the substrate is formed into a sheet (see Seeger, Jr., Figs. 2 and 3).

As to wherein the thickness of the seeding layer is from 3 to 5 microns, the WO reference teaches that the ink layers deposited by the lithographic printing process are about 5 micrometers. This may be compared to about 25 micrometers for conductive layers deposited by screen printing and 35-75 micrometers of copper typically laminated onto a conventional printed circuit board (page 4, lines 8-13). Since the WO reference is substituting conventional electrical circuit printing techniques with a lithographic printing process, a seeding layer having a thickness of from 3 to 5 microns would have been functionally equivalent in providing conductivity to the organic resin or plastic material substrate for the electroless deposition.

As to wherein the thickness of the first electrically conducting layer is less than or equal to 4 microns; and wherein the thickness of the first electrically conducting layer is about 0.25 microns, this is well within the skill of the artisan dependent upon the

intended use of the device, particularly to the environment to which the device will encounter, which would be most suited for the application of the device, absent evidence to the contrary.

Furthermore, the thickness of the first electrically conducting layer is a result-effective variable and one skilled in the art has the skill to calculate the thickness that would determine the success of the desired reaction to occur, e.g., thick enough to carry sufficient current, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Seeger teaches plating thicknesses of from 0.003 to 0.0008 inches (= 76 μ to 20 μ) [col. 8, lines 51-62].

II. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Seeger, Jr. et al.** (US Patent No. 4,759,970) in combination with **WO 97/48257** as applied to claims 1 and 20-29 above, and further in view of **Haney et al.** (US Patent No. 4,411,980).

Seeger, Jr. et al and WO 97/48257 are as applied above and incorporated herein.

Seeger, Jr. does not teach electroplating a second electrically conducting layer onto the first electrically conducting layer.

However, Haney teaches that it is conventional to form the circuit by one of

several additive techniques including electroless plating and electroplating (col. 1, lines 14-26; and col. 7, line 48 to col. 8, line 31).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the process of Seeger, Jr. by electroplating a second electrically conducting layer onto the first electrically conducting layer because electroless plating and electroplating are both commonly done in the printed circuit art. For example, it is known in the printed circuit art to first electrolessly plate a copper seed layer onto a printed circuit board and then electroplate a copper layer onto the copper seed layer to additionally building up the conducting circuit paths.

The transpositioning of varying steps, or varying the details of a process, as by adding a step or splitting one step into two does not avoid obviousness where the processes are substantially identical or equivalent in terms of function, manner and result. *General Foods Corp. v. Perk Foods Co.* (DC NIII 1968) (157 USPQ 14); *Malignani v. Germania Electric Lamp Co.*, 169 F. 299, 301 (D.N.J. 1909); *Matrix Contrast Corp. v. George Kellar*, 34 F.2d 510, 512, 2 USPQ 400, 402-403 (E.D.N.Y. 1929); *Hammerschlag Mfg. Co. v. Bancroft*, 32 F. 585, 589 (N.D.Ill.1887); *Procter & Gamble Mfg. Co. v. Refining*, 135 F.2d 900, 909, 57 USPQ 505, 513-514 (4th Cir. 1943); *Matherson-Selig Co. v. Carl Gorr Color Gard, Inc.*, 154 USPQ 265, 276 (N.D.Ill.1967).

III. Claims **19 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Seeger, Jr. et al.** (US Patent No. 4,759,970) in combination with **WO 97/48257** and **Haney et al.** (US Patent No. 4,411,980) as applied to claim 2 above, and further in view of **Brandt et al.** (US Patent No. 5,922,397).

Seeger, Jr. et al., WO 97/48257 and Haney et al. are as applied above and incorporated herein.

Seeger, Jr. does not teach attaching an electrical component to the first or second conducting layer by means of a conductive polymer adhesive; and attaching an electrical component to the first conducting layer by means of a conductive polymer adhesive

However, Brandt teaches that plated polymer thick film inks have been used to create conductive and solderable electronic circuit traces as well as plated through-holes for component attachment in printed circuit boards (col. 1, lines 44-61).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the process of Seeger, Jr. by attaching an electrical component to the first or second layer by means of a conductive polymer adhesive; and attaching an electrical component to the first conducting layer by means

of a conductive polymer adhesive because plated polymer thick film inks have been used to create conductive and solderable electronic circuit traces as well as plated through-holes for component attachment in printed circuit boards as taught by Brandt (col. 1, lines 44-61). Substitution of a solder paste with a conductive polymer adhesive would have been functionally equivalent and would have been doing the same endeavor of bonding an electrical component to a conducting layer of a printed circuit.

Furthermore, it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. See MPEP § 2144.06 and § 2144.07.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

Claim **35** defines over the prior art of record because the prior art does not teach or suggest an ink as claimed in claim 34 wherein the particulate material is a metal or carbon.

The prior art does not contain any language that teaches or suggests the above. *JP 63-74681* does not teach wherein the particulate material is a metal or carbon. Therefore, a person skilled in the art would not have been motivated to adopt the above conditions, and a prima facie case of obviousness cannot be established.

Claim 35 is objected to as being dependent upon a rejected base claim, but

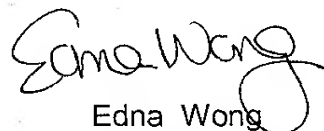
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would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (703) 308-3818. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.


Edna Wong
Primary Examiner
Art Unit 1753

EW
October 31, 2003